

## ***Thysanotus unicipensis* (Laxmanniaceae), a new species discovered in Unicup Nature Reserve, south-west Western Australia**

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### **Abstract**

Sirisena, U.M., Macfarlane, T.D. and Conran, J.G. *Thysanotus unicipensis* (Laxmanniaceae), a new species discovered in Unicup Nature Reserve, south-west Western Australia. *Nuytsia* 19(2): 259–263 (2009). *Thysanotus unicipensis* is described as a new species from south-west Western Australia. This species shows some affinities to *T. chinensis*, *T. formosus* and *T. parviflorus* and is apparently localised on lateritic soils in moderately sunny areas within Jarrah/Marri (*Eucalyptus marginata*/ *Corymbia calophylla*) woodlands. The key published in *Flora of Australia* (1987) is amended to include the new species.

### **Introduction**

The genus *Thysanotus* R.Br. *nom. cons.* (Asparagales: Laxmanniaceae *sensu* Angiosperm Phylogeny Group 2003) consists of over 50 species, all endemic or native to Australia, with *T. banksii* R.Br. and *T. chinensis* Benth. also in Papua New Guinea and the latter species extending to Malesia, Thailand, China and the Philippines (Jessop 1979, Conran 1998, Chen & Tamura 2000). Before being moved to Laxmanniaceae, the genus was variously placed in Liliaceae (Cronquist 1981), Anthericaceae (Marchant *et al.* 1987) or Lomandraceae (Chase *et al.* 1996; Conran 1998). The majority of the species occur in south-west Western Australia and following the treatments of Baker (1876) and Bentham (1878), Brittan described many new species from Western Australia (Brittan 1960, 1972), South Australia (Brittan 1971a, 1978) and New South Wales (Brittan 1971b). In his subsequent revision of the genus, Brittan (1981) recognised 47 species and in the later treatment for the *Flora of Australia* (Brittan 1987) this was increased to 49 species, of which 42 are Western Australian. Since then several new *Thysanotus* species have been recognised (Paczkowska & Chapman 2000; Macfarlane pers. comm.), although not yet described formally, and most require further collecting and study to define them more precisely.

While collecting material in Western Australia for a larger phylogenetic study of *Thysanotus* in late spring 2007, we observed and collected specimens of a species in the Unicup Nature Reserve c. 50 km east of Manjimup, south-west Western Australia which was not recognisable immediately and which was found subsequently to be morphologically distinct from all other known *Thysanotus* species. Further examination of material both from our collections and from accessions in the Western Australian Herbarium (PERTH) revealed that these specimens represented an unnamed species of *Thysanotus*. Accordingly, we here describe this new species following the descriptive terminology and criteria for species within the genus used by Brittan (1981, 1987).

## Description

***Thysanotus unicipensis*** Sirisena, T. Macfarlane & Conran, *sp. nov.*

Herba erectus. Radices fibrosae, non tuberosae. Folia recta, *c.* 30 cm longa, *c.* 2 mm lata, glabra, basin versus vaginis membranaceis. Inflorescentia sessile umbellarum (1–5) terminalium. Scapus simplex, 15 cm altus, teres, glaber. Umbellae floribus 2–3, bracteis lanceolateis, 5–6 mm longis, membrenaceis, acuminatis. Pedicelli 7–9 mm longi, prope basin articulati, florescentes erecti, fructiferi erectes. Segmenta perianthii 8–9.5 mm longa: tepala exteriora lanceolata, 1.2–1.5 mm lata, mucronata; tepala interiora latus elliptica, *c.* 3.2–3.5 mm lata, fimbriis *c.* 1.3 mm longis. Stamina 6, antherae strictae, non tortae vel haud tortae, 4 mm longae. Ovarium utroque loculis, ovulis 2. Stylus rectus vel haud curvatus. Capsula perianthio persistenti inclusa, 5 x 3 mm longa. Semina nigra, arillata.

*Typus:* Unicup Nature Reserve, Western Australia [precise locality withheld for conservation reasons], 28 November 2007, *U.M. Sirisena & T.D. Macfarlane* 13 (*holo:* PERTH).

Perennial herb *c.* 30 cm tall, with small rhizomes and fibrous-fleshy non-tuberous roots 10–12 cm long. *Leaves* green at flowering time, usually up to 5 per plant, basal, terete, glabrous, *c.* 30 cm long, *c.* 2 mm wide, expanding into membranous wings at base, margins entire; leaf bases enclosed by flat, white, oblong membranous bracts. *Scape* half to three quarters of length of leaves, usually unbranched. *Inflorescence* made of umbels aggregated in a terminal cluster which superficially resembles a single umbel, usually 2–4 flowers per umbel, the whole cluster of 7–17 flowers but sometimes with 1 or 2 bracts either empty or subtending sessile or shortly pedunculate secondary umbel cluster; umbel bracts usually 3, ovate to lanceolate, 5–7 (–10.5) mm long, 2–3.5 mm wide, margin broad, membranous, apex acuminate. *Pedicel* 7–9 mm long, articulated towards the base, erect in flower and fruit. *Tepals* 8–9.5 mm long, outer 3 lanceolate, 1.2–1.5 mm wide, mucronate, inner three broadly elliptic-circular, 3.2–3.5 mm wide; fimbriae *c.* 1.3 mm long. *Stamens* 6, filaments *c.* 1.5 mm long; anthers subequal, basifixed, purple, paler towards the tip, straight, slightly twisted or not twisted, dehiscence by a terminal pore; pores *c.* 0.5 mm long, the back lip exceeding the front lip, outer anthers 3.6 mm long, inner anthers 3.8–4 mm long. *Ovary* trilocular with 2 ovules per loculus, style straight to slightly curved. *Capsule* ellipsoid, *c.* 5 by 3 mm, enclosed within persistent perianth segments forming only a short tail. *Seed* black, narrowly ellipsoid, *c.* 1.5 mm long, *c.* 1 mm wide with strongly convex periclinal walls and striated microsculpturing; aril straw coloured and sessile. (Figure 1)

*Specimens examined.* Unicup Nature Reserve, WESTERN AUSTRALIA: [precise localities withheld for conservation reasons], 28 Nov. 2007, *U.M. Sirisena & T.D. Macfarlane* 16 (PERTH); 7 Dec. 2007, *T.D. Macfarlane* 4183 & *R.W. Hearn* (PERTH); 20 Oct. 1997, *A.D. Robinson* K 69 (PERTH); Nov. 1997, *A.D. Robinson & B.G. Ward* K 89 (PERTH); 5 Dec. 1991, *G.S. McCutcheon* 2435 (PERTH); 29 Oct. 1998, *R. Davis* 8564 (PERTH).

*Distribution and habitat.* Known from Unicup Nature Reserve to the Mulallyup and Boyup Brook areas, south-west Western Australia. *Thysanotus unicipensis* grows on dry lateritic and grey sandy soils in moderately sunny places within Jarrah/Marri forests.

At the Unicup Nature Reserve *Thysanotus patersonii* R.Br., *T. multiflorus* R.Br. and *T. thyrsoides* Baker co-occur with *T. unicipensis*, but show spatial and/or temporal separation. *Thysanotus patersonii* and *T. unicipensis* both grow in moderately sunny places within the Jarrah/Marri woodland, but *T. patersonii* was already fruiting when the latter was flowering. In contrast, *T. multiflorus* and



Figure 1. *Thysanotus unicipensis*. A – habit; B – fleshy roots; C – inflorescence; D – flowers and fruits; E – seed; F – periclinal walls on seed surface. Scale bars: A = 10 cm; B = 5 cm; C–D = 10 mm; E = 500 µm; F = 50 µm. Voucher: Sirisena & Macfarlane 13 (PERTH). Photographs by Udani M. Sirisena.

*T. thyrsoides* flowered simultaneously with *T. unicipensis*, but the former two grew on the more exposed, sunny edges of the forest rather than the more sheltered interior.

*Phenology*. Flowering late October to early December.

*Conservation status*. Currently listed as Priority Two under the Department of Environment and Conservation (DEC) Conservation Codes for Western Australia. The species has only been collected a few times although over a range of approximately 100 km in an area with extensive forest including conservation reserves. A systematic survey has not yet been carried out although some localised

searches have been conducted, and the various collections were only recognised as belonging together as a single taxon after we saw live plants and understood its distinctness.

*Etymology.* Named after the Unicap Nature Reserve where we first recognised the species.

*Notes.* Possession of fleshy roots in *Thysanotus unicipensis* may indicate a relationship to *T. chinensis*, *T. formosus* Brittan and *T. parviflorus* Brittan which also possess fleshy, non-tuberous roots. Although *T. chinensis* was described by Payens (1957), Jessop (1979) and Brittan (1987) as having fibrous roots, examination of live specimens from Queensland and the Northern Territory revealed that it possesses fleshy, non-tuberous roots when alive. These three species share several other morphological features such as an erect habit, glabrous scape and leaves, terete leaves, six stamens and anther dehiscence by a terminal pore. *Thysanotus unicipensis* is most easily distinguished from these other species by having straight to slightly twisted anthers of more or less equal length, sessile umbels clustered towards the scape apex and leaves more or less twice as long as the scape. Out of these three putative relatives, the new species seems closer to *T. formosus* than to either *T. parviflorus* or *T. chinensis*, as it shares with the former features such as a simple scape with sessile umbels and erect pedicels in flower and fruit. In contrast, the scape of *T. parviflorus* is unbranched to 4-branched, bearing pairs of closely appressed umbels at the apex, whereas the buds and fruits of *T. chinensis* are pendant (Brittan 1981).

The inflorescence structure of *T. unicipensis* and *T. formosus* is unusual in the genus where the umbels are usually discrete and easily delimited, despite varying from 1 - 2-flowered to many-flowered. In those two species the umbels are less easily delimited. The whole inflorescence of *T. unicipensis*, when best developed, consists of a terminal aggregation of flowers which looks superficially like a many-flowered umbel, and one or more smaller umbels below, either sessile or on short, obscure branches. Whilst these smaller umbels may be discrete and clearly separated from the terminal flowers, the terminal aggregation on closer examination looks more like a loose collection of several small umbels bearing as few as two flowers. *Thysanotus formosus* likewise has small umbels, usually 2-flowered, that aggregate to resemble superficially a larger umbel.

### Amendment to published key to *Thysanotus* species

The key published in *Flora of Australia* (Brittan 1987) is amended to accommodate *Thysanotus unicipensis* by inserting a new couplet 10a within couplet 10. Couplet 10 is reached with plants that have six stamens having equal or subequal anthers, an annual scapose inflorescence that is not paniculate, and flowers usually two or more per umbel.

- 10** Inflorescence not paniculate, a single terminal umbel or cluster, sometimes with 1 or 2 subterminal umbels sessile or on a short branch
- 10a** Roots tuberous; anthers dehiscing by slits; pedicels of fruit nutant ..... **T. isantherus**
- 10a:** Roots not tuberous; anthers dehiscing by terminal pores; pedicels of fruit erect ..... **T. unicipensis**
- 10:** Inflorescence paniculate

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